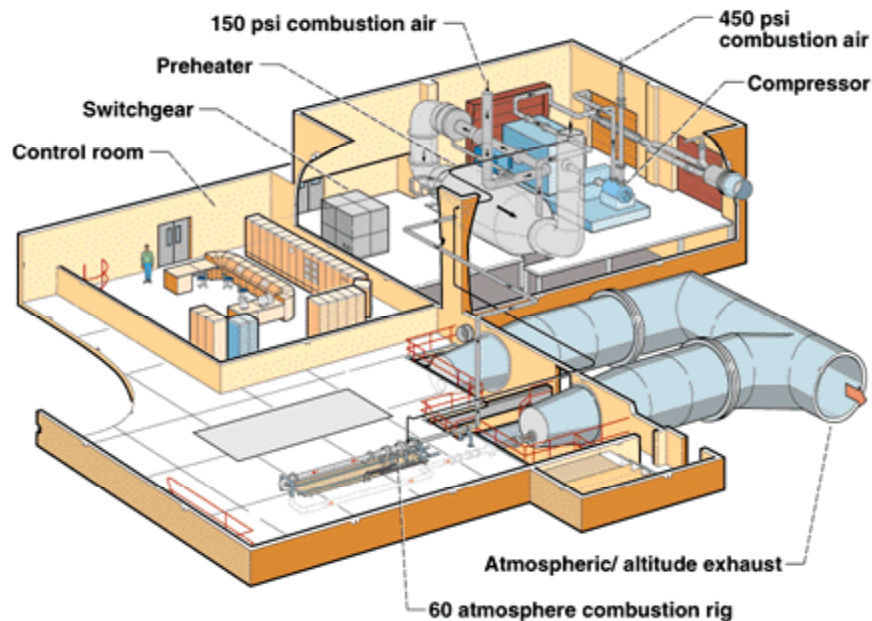


Advanced Subsonic Combustion Rig Developed

The Advanced Subsonic Combustion Rig (ASCR), a unique, state-of-the-art facility for conducting combustion research, is located at the NASA Lewis Research Center in Cleveland, Ohio. The ASCR, which was nearing completion at the close of 1995, will be capable of simulating the very high pressure and high temperature conditions that are expected to exist in future, advanced subsonic gas turbine (jet) engines. Future environmental regulations will require much cleaner burning (more environmentally friendly) aircraft engines. The ASCR is critical to the development of these cleaner engines. It will allow NASA and U.S. aircraft engine industry researchers to identify and test promising clean-burning gas turbine engine combustion concepts under the pressure and temperature conditions that are expected for those future engines. Combustion processes will be investigated for a variety of next-generation aircraft engine sizes, including engines for large, long-range aircraft (with typical trip lengths of about 3000 mi) and for regional aircraft (with typical trip lengths of about 400 mi).

The ASCR design was conceived and initiated in 1993, and fabrication and construction of the rig, including the buildup of an advanced control room, took place throughout 1994 and 1995. In early 1996, the ASCR will be operational for obtaining research data.

The ASCR is an intricate part of the NASA Advanced Subsonic Technology Propulsion Program, which is aimed at developing technologies critical to the next generation of gas turbine engines. This effort is in collaboration with the U.S. aircraft gas turbine engine industry. A goal of the Advanced Subsonic Technology Propulsion Program is to develop combustion concepts and technologies that will result in gas turbine engines that produce 50 percent less nitrous oxide (NO_x) pollutants than current engines do.



Advanced Subsonic Combustion Rig.

This facility is unique in its capability to simulate advanced subsonic engine pressure, temperature, and air flow rate conditions. Specifically, it will provide operating temperatures up to 3000 °F and pressures up to 60 atm. Under these conditions, researchers will obtain detailed combustion temperatures, pressures, and flow velocities as well as the chemical compositions of the combustion exhaust. Researchers also will be able to obtain data by using nonintrusive laser diagnostic techniques. The ASCR facility will be used to test fundamental combustion configurations (flametubes) for detailed study of combustion processes, to test sectors of gas turbine combustors to study the process in configurations more like those of aircraft engines, and in some cases to test full annular combustors.